

**IMPACT OF TECHNOLOGICAL,
ORGANIZATIONAL AND ENVIRONMENTAL
FACTORS ON INTENTION TO CONTINUE
USING B2B E-COMMERCE BY SMALL AND
MEDIUM ENTERPRISES (SMEs) IN JORDAN**

by

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for the degree of
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DEDICATION

To the soul of my beloved brother “Ehab”, may Allah forgive him and grant him in highest paradise.

To my idol in this life, my father and my mother, thank you for supporting me not in this study, but throughout my entire life. Without your encouragement and support, I can't finish my study, No word can describe what they have done for me, thank you.

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To my beloved kids, my daughter Hiba and my son Ehab.

To my dearest brothers, and my best sister

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TABLES OF CONTENTS

	Page
Acknowledgement	ii
Table of Contents	iii
List of Tables	x
List of Figures	xii
List of Abbreviations	xiii
Abstrak	xiv
Abstract	xvi

CHAPTER 1- INTRODUCTION

1.1	Background	1
1.2	E-commerce and SMEs in Jordan	2
1.3	Research Problem	7
1.4	Research Objectives	10
1.5	Research Questions	10
1.6	Research Scope	11
1.7	Research Methodology	11
1.8	Significance of the Research	14
	1.8.1 Theoretical Contributions	14
	1.8.2 Practical Contributions	15
1.9	Operational Definition of Terms	16
1.10	Organization of Thesis	17

CHAPTER 2- LITREATURE REVIEW

2.1	Introduction	19
2.2	SMEs definitions and Importance	19
2.3	B2B E-commerce Definition	21
2.4	Benefits of eB2B e-commerce Technology	23
2.5	Level of B2B e-commerce Adoption	25
2.6	Theories of IS adoption at organization level	28
2.6.1	Theory of Reasoned Action (TRA)	29
2.6.2	Technology Acceptance Model (TAM)	30
2.6.3	Diffusion of Innovation Theory (DOI)	32
2.6.4	Technology Organization and Environment Framework	35
2.6.5	Institutional Theory	36
2.7	Previous Studies using TOE Framework	37
2.8	B2B E-commerce Technology Adoption in Previous studies	39
2.9	Identified Factors Affecting B2B E-commerce Adoption in Previous Studies	45
2.9.1	Technological Factors	47
2.9.1(a)	Relative Advantage	47
2.9.2(b)	Compatibility	51
2.9.2	Organizational Factors	55
2.9.2(a)	Top Management Support	55
2.9.2(b)	Financial Resource	60
2.9.3	Environmental Factors	65
2.9.3(a)	Competitive Pressure	65

	2.9.3(b)	Information Intensity	69
	2.9.3(c)	Security	73
2.10		External IT Support in Previous Studies	76
2.11		Perceived Usefulness in Previous Studies	78
2.12		Summary	80

CHAPTER 3- THEORETICAL FRAMEWORK AND HYPOTHESIS

3.1		Introduction	81
3.2		Development of the Theoretical Framework	81
3.3		Selection of Variables and Hypothesis Development	88
	3.3.1	Dependent variable: Intention to Continue using B2B e-commerce	88
	3.3.2	The Relationship between Relative Advantage and Perceived Usefulness	90
	3.3.3	The Relationship between Compatibility and Perceived Usefulness	93
	3.3.4	The Relationship between Top Management Support and Perceived Usefulness	95
	3.3.5	The Relationship between Financial Resource and Perceived Usefulness	98
	3.3.6	The Relationship between Competitive Pressure and Perceived Usefulness	99
	3.3.7	The Relationship between Information Intensity and Perceived Usefulness	102

3.3.8	The Relationship between Security and Perceived Usefulness	104
3.3.9	Perceived Usefulness as Mediator	106
3.3.10	External IT Support as a Moderator	109
3.4	The proposed Framework	111
3.5	Summary	113

CHAPTER 4- RESEARCH METHODOLOGY

4.1	Introduction	115
4.2	Research Design for this Study	115
4.3	Preliminary Study	118
4.4	Population of the Study	119
4.5	Sampling Unit	119
4.6	Sampling Frame	119
4.7	Sampling Method and Sample Size	121
4.8	Questionnaire Design	122
4.9	Construct Measurement	124
4.10	Data Collection Method	134
4.11	Expert review of Questionnaire	135
4.12	Questionnaire Translation	135
4.13	Pilot Study	136
4.14	Statistical Data Analysis	139
4.14.1	Common Method Bias	139
4.15	Partial Least Squares Technique	140

4.15.1	Assessment of Measurement Model	141
4.15.1(a)	Convergent Validity	141
4.15.1(b)	Discriminet Validity	142
4.15.2	Assessment of Structual Model	143
4.15.2(a)	Mediator Analysis	143
4.15.2(b)	Moderator Analysis	146
4.16	Summary	148

CHAPTER 5- DATA ANALYSIS AND RESULTS

5.1	Introduction	149
5.2	Response Rate	149
5.3	Common Method Bias	152
5.4	Demographic Profile	152
5.5	Descriptive Analysis	155
5.6	Data Analysis	156
5.6.1	Measurnment Model	156
5.6.1(a)	Convergent Validity	156
5.6.1(b)	Discriminant Validity	158
5.6.2	Structural Model	162
5.6.2(a)	Predictive Power (R^2)	162
5.6.2(b)	Predictive Relevance (Q^2)	164
5.6.2(c)	Effect Size	166
5.6.2(d)	Direct Effects	167
5.6.2(e)	Indirect Effect	169
5.6.2(f)	Moderator Effect	170

5.7	Summary of Findings	176
5.8	Summary	178

CHAPTER 6- DISCUSSION AND CONCLUSION

6.1	Introduction	179
6.2	Summary of Main Findings	179
6.3	Discussion of Findings	181
6.3.1	What Are the Technological, Organizational and Environmental Factors Influencing Perceived Usefulness in Manufacturing SMEs in Jordan?	181
6.3.2	What is the Relationship between Perceived Usefulness and Intention to Continue using B2B e-commerce?	189
6.3.3	Does Perceived Usefulness Mediate the Relationship between Technological, Organizational and Environmental Factors and the Intention to Continue using B2B e-commerce?	190
6.3.4	Does External IT Support Moderate the Relationship between the Perceived Usefulness and the Intention to Continue using B2B e-commerce?	191
6.3.5	What is the Guidance to Decision Makers, IT Consultants and Web Vendors to facilitate the adoption of B2B e-commerce Technology?	195
6.4	Practical Contribution	196
6.4.1	Implication for Managers	196
6.4.2	Implication for Agencies	199

6.4.2	Implication for Developers	204
6.5	Theoretical Contribution	206
6.6	Limitation of the Study	207
6.7	Suggestion for Future Research	208
6.8	Conclusion	210
REFERENCES		212
APPENDICES		

LIST OF TABLES

	Page
Table 2.1	Definition of SMEs in Jordan 21
Table 2.2	B2B e-commerce definition 22
Table 2.3	B2B e-commerce benefits 24
Table 2.4	Summary of Previous Studies of B2B e-commerce Technology 40
Table 2.5	Identified Important Factors Affecting B2B e-commerce Technology in the Literature 45
Table 2.6	Relative Advantage in Past Studies 49
Table 2.7	Compatibility in past studies 53
Table 2.8	Top management support in past studies 58
Table 2.9	Financial Resource in past studies 62
Table 2.10	Competitive pressure in past studies 67
Table 2.11	Information Intensity in previous studies 71
Table 2.12	Security in previous studies 75
Table 3.1	Summary of Main Variables and Comments on Theories and Models of Technology Adoption 82
Table 3.2	Summary of Developed Hypothesis 113
Table 4.1	Industrial Organizations distribution in the Jordan Chamber of Industry 120
Table 4.2	Distributed of registered organization at the Amman Chamber of Industry, by Employment Category 120
Table 4.3	Relative advantage items 125
Table 4.4	Compatibility items 126

Table 4.5	Top management items	127
Table 4.6	Financial resources items	128
Table 4.7	Competitive pressure items	129
Table 4.8	Information intensity items	130
Table 4.9	Security items	131
Table 4.10	Perceived usefulness items	132
Table 4.11	External IT Support items	133
Table 4.12	Intention to continue use B2B e-commerce items	134
Table 4.13	Revisions of questionnaire based on expert review	135
Table 4.14	Cronbach's Alpha score of instrument scales	138
Table 4.15	Revisions of questionnaire based on the pilot study	138
Table 5.1	Response Rate of Data Collection	150
Table 5.2	Profile of the respondents	153
Table 5.3	Profile of the organizations	154
Table 5.4	The results of descriptive statistics on latent variable	155
Table 5.5	Construct Validity	157
Table 5.6	Discriminant validity	159
Table 5.7	Loadings and Cross Loadings	160
Table 5.8	Heterotrait-monotrait ratio (HTMT)	161
Table 5.9	Effect Size	166
Table 5.10	Direct effects of Path model	168
Table 5.11	Indirect effects of Path model	170
Table 5.12	Result for Moderator	173
Table 5.13	Summary of hypothesis analysis (n=251)	176

LIST OF FIGURES

	Page
Figure 2.1 Theory of Reasoned Action (TRA)	29
Figure 2.2 Technology Acceptance Model	31
Figure 2.3 Technology-Organizational-Environmental Model (TOE)	35
Figure 3.1 The proposed research framework for adoption of e-commerce by Jordanian SMEs	112
Figure 4.1 Direct and indirect effect between variables	141
Figure 5.1 PLS-Path analysis of R-square values	163
Figure 5.2 Blindfolding and Q^2 Result	165
Figure 5.3 Path Coefficient and t-value	168
Figure 5.4 PLS-Path analysis showing coefficients of determinants (without interaction)	172
Figure 5.5 PLS analysis and t-value (with interaction)	174
Figure 5.6 Plotting the PU interaction	175

LIST OF ABBREVIATIONS

AIS	Accounting Information System
B2B	Business-to-Business
E-business	Electronic business
EDI	Electronic Data Interchange
E-HRM	Electronic human Resources Management
E-Managemnt	Electronic Management
E-Market	Electronic Market
ERP	Enterprise Resources Planning
GDP	Gross Domestic Product
HIS	Hospital Information System
ICT	Information Communication Technology
IS	Information System
JEDCO	Jordan Enterprise Development Corporation
KMS	Knowledge Management Systems
M-Commerce	Mobile Commerce
NFC	Near Field Communication
RFID	Radio-Frequency Identification

**KESAN FAKTOR TEKNOLOGI, ORGANISASI DAN PERSEKITARAN
TERHADAP HASRAT UNTUK TERUS MENGGUNAKAN E-DAGANG B2B
OLEH PERUSAHAAN KECIL DAN SEDERHANA (PKS) DI JORDAN**

ABSTRAK

Penggunaan perdagangan elektronik (e-dagang) bagi model perniagaan dalam kategori Perniagaan kepada Perniagaan (B2B) dalam operasi perniagaan pada masa kini tidak lagi merupakan satu keistimewaan untuk organisasi besar semata-mata; perusahaan kecil dan sederhana (PKS) juga boleh mendapat manfaat daripada penggunaannya. Walaupun PKS dianggap memainkan peranan penting dalam pertumbuhan ekonomi bagi kebanyakan negara, PKS umumnya bergerak lebih perlahan dalam menggunakan e-dagang B2B berbanding dengan organisasi yang lebih besar. Seterusnya, ini menjadikan PKS lebih mudah terdedah kepada sebarang perubahan dalam keadaan ekonomi kerana mereka akan mempunyai tahap daya saing yang rendah. PKS di Jordan, sebuah negara membangun, membentuk majoriti terbesar organisasi perniagaan Jordan dengan kira-kira 98% daripadanya adalah PKS. Oleh itu, penting untuk menentukan faktor yang mempengaruhi hasrat untuk terus menggunakan e-dagang B2B oleh PKS supaya mereka boleh terus menggunakannya dengan berkesan tanpa membazirkan sumber mereka yang terhad. Ada banyak kajian yang telah dilakukan mengenai penggunaan e-dagang B2B tetapi kebanyakan kajian memberi tumpuan kepada organisasi besar. Oleh itu, kajian ini bertujuan untuk mengkaji faktor-faktor yang mempengaruhi hasrat untuk terus menggunakan e-dagang kategori B2B dalam kalangan PKS di Jordan dengan menggunakan Model Teknologi, Organisasi dan Persekitaran (TOE) yang telah dibangunkan oleh Tornatzky dan Fleischer. Kaedah kuantitatif telah digunakan

dalam kajian ini yang pengumpulan datanya telah dilakukan dengan menggunakan soal selidik yang ditadbir sendiri dan diedarkan kepada PKS dalam sektor perkilangan di Amman. Jumlah soal selidik yang sah adalah 251, membentuk kadar sambutan sebanyak 55.8%. Analisis data dengan menggunakan teknik Pemodelan Persamaan Struktur Kuasadua Terkecil Separa (PLS-SEM) menunjukkan bahawa kelebihan relatif, sokongan pengurusan atasan, tekanan persaingan dan keamanan maklumat mempunyai kesan tidak langsung yang besar terhadap hasrat untuk terus menggunakan e-dagang B2B, melalui tanggapan manfaat. Tanggapan manfaat, daripada Model Penerimaan Teknologi (TAM), menjadi pengantara hubungan setiap satu daripada dua faktor: sokongan pengurusan atasan, tekanan persaingan dan keamanan maklumat dengan hasrat untuk terus menggunakan e-dagang B2B. Sokongan teknologi maklumat luaran, satu pembolehubah penyederhana yang baru, digunakan untuk menyederhanakan kesan di antara tanggapan manfaat dan hasrat untuk terus menggunakan e-dagang B2B. Hasil dapatan kajian adalah penting dalam menangani isu-isu yang memberi kesan kepada penggunaan e-dagang B2B kerana dapatan ini boleh dimanfaatkan oleh pengurus, vendor teknologi maklumat, pemaju e-dagang dan juga kerajaan dalam merangka pelan tindakan untuk meningkatkan penggunaan e-dagang B2B serta meluaskan manfaat penggunaannya. Selain itu, kerangka konseptual kajian ini turut memberikan penjelasan faktor-faktor yang mempengaruhi hasrat untuk terus menggunakan e-dagang B2B bagi PKS dalam sektor pembuatan, yang memberi sumbangan kepada pengetahuan secara khususnya dalam bidang sistem maklumat dan secara amnya dalam konteks penggunaan e-dagang B2B di negara-negara membangun.

**IMPACT OF TECHNOLOGICAL, ORGANIZATIONAL AND
ENVIRONMENTAL FACTORS ON INTENTION TO CONTINUE USING
B2B E-COMMERCE BY SMALL AND MEDIUM ENTERPRISES (SMEs)
IN JORDAN**

ABSTRACT

The adoption of electronic commerce (e-commerce) for the Business to Business (B2B) business model category in business operations is currently no longer a privilege merely to large organizations; the small and medium enterprises (SMEs) can also benefit from the adoption. Although the SMEs are considered to play a major role in the economic growth for most nations, they are generally moving slower towards adopting B2B e-commerce compared to larger organizations. Subsequently this makes SMEs more susceptible to any changes in the economic conditions as they would have relatively low levels of competitiveness. It is important to determine the factors influencing intention to continue using B2B e-commerce by the SMEs so that they can effectively use it without wasting their limited resources. Many studies have been done on the adoption of B2B e-commerce but most of them focus on large organizations. Therefore, this study aims to examine the factors that effect the intention to continue using B2B e-commerce among the manufacturing SMEs in Jordan using the Technological, Organizational and Environmental Model (TOE) that has been developed by Tornatzky and Fleischer. The quantitative method has been applied in this study where data collection has been done using self-administrated questionnaire distributed to the SMEs in the manufacturing sector in Amman. The total number of valid questionnaires is 251, constituting a response rate of 55.8%. Data analysis using Partial Least Squares

Structural Equation Modeling (PLS-SEM) technique indicates that relative advantage, top management support, competitive pressure and information intensity have significant indirect effect on intention to continue using B2B e-commerce, through perceived usefulness. Perceived usefulness, from the Technology Acceptance Model (TAM), mediates the relationship of two factors: top management support and competitive pressure, with intention to continue using B2B e-commerce. External information technology support, a new moderator variable, is applied to moderate the effect between perceived usefulness and the intention to continue using B2B e-commerce. The findings of the study are important in tending the issues that affects the use of B2B e-commerce as they can be beneficial to managers of the SMEs, information technology vendors, e-commerce developers as well as the government in drawing a roadmap for increasing B2B e-commerce usage and expanding the benefits of the usage. Moreover, the conceptual framework of the study provides the explanation of factors affecting the intention to continue using B2B e-commerce of the SMEs in the manufacturing sector, contributing to the knowledge particularly in the area of information systems and generally in the context of B2B e-commerce technology in developing countries.

CHAPTER 1

INTRODUCTION

1.1 Background

The internet revolutions has brought about a new kind of business transaction called electronic commerce which provides great opportunities for organizations to conduct more and better business transactions. Electronic commerce or e-commerce can permit an organization to be in contact with potential customers and suppliers through the web. E-commerce allows the transactions of a business to be electronically performed and such move has generated substantial operational and strategic benefits. E-commerce is originally categorized into four main business models: Business to Business (B2B), Business to Consumer (B2C), Consumer to Consumer (C2C) and Consumer to Business (C2B) business models. However, in relation to governance, two other business models: Government to Customers (G2C) and Customers to Government(C2G), have also been defined (Kalakota, 1997).

The B2B e-commerce market is generally more profitable than the B2C e-commerce market because its volume is almost ten times that of the B2C e-commerce market (Mohtaramzadeh et al., 2017). For example, the US adoption of B2B e-commerce technologies accounts for \$5.8 trillion in value, representing 91% of total E-commerce volume (US Census Bureau, 2015); in the Republic of Korea, B2B e-commerce accounted for 91% of e-commerce value, and in the Russian Federation it was estimated at 58% in 2013 (Unctad, 2015). There are also positive perspective projections for the future of B2B e-commerce in emerging economies such as India and China (Sila, 2013).

Many studies have predicted that B2B e-commerce will dominate the world economy where B2B e-commerce is considered to be a significant determinant of future growth of the economy (Ghobakloo et al., 2011). Developed countries have aggressively implemented B2B e-commerce and in fact, B2B e-commerce has become an essential part of business activities in these countries (Alsaad et al., 2017; Hasan et al., 2012). Adoption of B2B e-commerce could decrease not only the digital gap, but also the economic gap between the developed and developing nations (Abdullah et al., 2013; Mohtaramzadeh et al., 2017).

Compared to other business sectors, manufacturers made more widespread use of B2B e-commerce. For example, the American manufacturers' B2B e-commerce activities were the highest amongst all sectors, accounting for 42% of total shipments or \$1,862 billion (Sila, 2013). Moreover, manufacturing SMEs, regardless of their size, are the engine of economic growth. Therefore, the manufacturing sector and its industrial SMEs are highly important in view of generating economic growth (Mohtaramzadeh et al., 2017). However, with regard to e-commerce adoption, a study has indicated that the majority of adoption e-commerce is by the companies in the service sector as opposed to companies in the manufacturing sector (Al-Dmour & Al-Sukri, 2012). Despite the fact that such SMEs are important for the economic growth and global market development, very limited empirical e-commerce studies have been done to investigate B2B e-commerce adoption by manufacturing SMEs in Arab developing countries (Al-Somali et al., 2011; Elbeltagi et al., 2016).

1.2 E-commerce and SMEs in Jordan

In Jordan, e-commerce has developed significantly over the last few years. The Hashemite Kingdom of Jordan (Al-Mamlakah Al-Urdunniyah Al-Hashimiyah),

which is a developing country, is located in the heart of the Middle East, bordered by Saudi Arabia to the east and south, Iraq to the northeast, Syria to the north, Israel, Palestine and the Dead Sea to the west and the Red Sea is located at its extreme south-west.

For information and communication technologies, Jordan displayed a steady growth in infrastructure in the last decade. Strategic plans were developed and investments allocated to optimize ICTs infrastructure. Although the environment for e-commerce is still in early stages of development and therefore has not yet acquired a sufficient level of readiness and usage penetration, Jordan has a strong ICTs and e-commerce agenda, which can have a significant impact on its development (Alrousan, 2016).

According to the Ministry of Information and Communication Technology of Jordan (2007), e-commerce is defined as: “*Transactions between consumers and businesses or between businesses associated with the development or trade of goods and services over a broadcast network.*” For B2B e-commerce, the definition is given by: “*B2B e-commerce refers to all forms of wholesale commercial transactions conducted over an exclusive computer-mediated network or an open computer-mediated network*”.

In relation to B2B e-commerce, two of the goals of the Kingdom of Jordan are to be one of the leading countries in the region in e-commerce adoption and to have a channel for both domestic and international businesses which includes business collaboration and trade. Having acknowledged the importance of e-commerce, the Ministry of Information and Communications Technology (MOICT) in Jordan has prepared a national e-commerce strategy, beginning from 2007-2012 to mobilize the nation to develop technical and commercial capacity and to adopt e-

commerce in trading goods and services between business organizations and with consumers. The government in Jordan realized that B2B e-commerce is very important because of its benefits to individual organizations as well as to the overall economy of the country such as reduced costs and improvement of efficiency. The usage of B2B e-commerce makes the business market more competitive resulting in lower prices of products and services. The development of B2B e-commerce in Jordan is intended to serve the following targets:

- (i) To increase the efficiency and wealth generation capacity of the Jordanian economy.
- (ii) To increase the number of businesses that use e-commerce for organizations within Jordan, within in the Arab region and also worldwide.
- (iii) To catalyze wholesale e-commerce business startups.
- (iv) To maximize Jordanian organization participation in global supply chains that use e-commerce as their channel.
- (v) To extend the range of goods and services available to Jordanian organizations.
- (vi) To extend the reach of Jordanian organizations in existing international markets and also to reach new international markets.

In Jordan, the SMEs are the vast majority of the Jordanian enterprises. The economic sector in Jordan is categorized into three main sectors: industrial, services, and agriculture where around 98% of industry and service organizations in Jordan are small and medium enterprises (Department of Statistics, 2011). The SMEs are particularly important to Jordan's economy since the SMEs assumes a significant

role in employment, accounting for 97% of all jobs and provide for about 96% of all exports and contribute about 50% of Jordan's GDP (JEDCO, 2011). The classification of the SMEs in Jordan is based on the number of employees and the capital investment. In general, both the Ministry of Industry and Trade in Jordan and the Amman Chamber of Industry have classified SMEs into micro, small and medium sizes where the micro size business are those with less than 9 employees, the small size business with less than 49 employees and the medium size with less than 249 employees.

Jordan's economy is dominated by services where the service sector, which are without support, subsidies and exemptions, has continued to grow faster than the supported and sometimes subsidized industry, agriculture and electricity sectors. The service sector is responsible for 67% of Jordan's GDP, while the combined sectors of manufacturing, agriculture, mining, water and electricity do not exceed 33% of the nation's GDP (The Jordan Times, 2016).

The Jordanian industrial sector consists mainly of the mining and quarrying sector, and manufacturing sector. This industrial sector stands as one of the main pillars of the Jordanian economy, contributing directly to about a quarter of the national economy in terms of GDP. The manufacturing sector, which is an important subsector of the industrial sector, accounts for 20.4 % of GDP during 2004-2008 and was maintained in 2011, while the contribution of the mining and quarrying sector to GDP is very small reaching less than 3% (Muhtaseb, 2015).

The government in Jordan sees the future of Jordan as an industrialized country and this means that the focus of Jordanian economy would be in industry rather than in services (Fanek, 2015). Another focus of the nation is on the new way of doing business through B2B e-commerce. Development of the SMEs is very

important to the Jordan's economic growth where B2B e-commerce adoption by manufacturing SMEs is considered as a significant component strategy to support the market and to increase the GDP for industry sector.

In Jordan, the government has made tremendous efforts to increase the awareness of e-commerce among the owners of SMEs as well as to encourage them to use B2B e-commerce for into their business organizations (Al-Bakri & Katsioloudes, 2015). The Jordanian Government has made initiatives to set up a solid network infrastructure over a few years (Yaseen et al., 2016). Despite these efforts, Jordan e-commerce adoption has been found to be relatively slow where about 90% of Jordanian SMEs are only using the e-mail, which is a very basic internet tool, for their business activities without having even a simple website (Alrousan, 2016). Few SMEs have websites that only present information about their business and even fewer have a more advanced website with more complex business activities such online payment.

According to the survey of the Department of Statistics (2015), out of the total number of 19,725 of organizations that had access to the internet in Jordan, only 34.2% of them had websites. In addition, of the total number of establishments for manufacturing organizations that had a site on the internet, which constituted 6,754 organizations, the percentage of economic organizations that host their sites on the internet was 48.8%.

Having started the strive towards being a country with pronounced research and development of information technology as early as 1999, unlike some of its middle per capita income Arab counterparts, Jordan has gone long and deep into the development of ICT by having the support from Information and Communication Technology Association of Jordan (INTAJ) which was established in 2000 (Al-Ali,

2014). Furthermore, Jordan is known to have strong IT skills sector in Jordan and being blessed with skilled technicians and engineers, Jordan has emerged as the home of many information technology companies, several of which are even providing outsourcing services outside of Jordan.

1.3 Research Problem

Despite the tremendous effort of the Jordanian government in terms of IT development in the country, the report of the Ministry of Information and Communication Technology for the year 2016 indicated that in the extent to which B2B e-commerce is used by business organizations in the country, the rank for Jordan has fallen from 39th to 51st place with Jordan's score reduced from 5.3 to 5.0. This indicates the possibility of discontinuance in using B2B e-commerce among business organizations.

The consequences from Jordanian SMEs not continuing to use B2B e-commerce include:

- (a) Loss of the amount of potential future growth to the individual SMEs.
- (b) Failure to improve the B2B e-commerce ranking of Jordan.
- (c) Wastage of the earlier effort in convincing the SMEs to adopt B2B e-commerce.
- (d) Loss of the amount of potential future growth of Jordan's economy from B2B e-commerce adoption.
- (e) Stagnation of the achievement of the goal of the Kingdom of Jordan to be one of the leading countries in e-commerce adoption.

While the B2B e-commerce expansion in the country can be considered as low, some organizations may have even discontinued using B2B e-commerce for their business. These organizations may have not perceived the usefulness of B2B e-commerce in increasing the performance for their business. Perceived usefulness of continuance of using B2B e-commerce is a possible contributing factor. Therefore, it is crucial to study factors such as perceived usefulness that would influence the continuance of using B2B e-commerce by the manufacturing SMEs in Jordan.

There have already been numerous studies that examined factors influencing B2B e-commerce adoption (Al-Bakri & Katsioloudes, 2015; Mohtaramzadeh et al., 2017). However, looking at the consequences of discontinued adoption of B2B e-commerce by the SMEs, there is a need to focus on factors that contribute towards the intention to continue using B2B e-commerce among the manufacturing SMEs. It has been asserted that the continuance of the use of e-commerce is not only critical towards the establishment of an organization but also on the future exponential growth of a nation (Ramayah et.al, 2016). Lack of technical knowledge has been frequently discussed as an important barrier towards using B2B e-commerce in developing countries (Alrousan, 2016; Lip-Sam & Hock-Eam, 2011). The SMEs would need to train their staff on B2B e-commerce technology. Since all this requires a lot of effort, time and financial resource from the SMEs, an alternative action is to advice the SMEs to seek external IT support (Ramayah, 2016).

Factors influencing B2B e-commerce adoption may be technological factors such as relative advantage and compatibility (Alsaad et al., 2017). Organizational factors would be factors that are within the organization itself such as top management support (Mohtaramzadeh et.al, 2017) and financial resource (Sila, 2013). Under the context of environment, the factors in concern may involve security

(Sila 2013) and competitive pressure (Al-Bakri & Katsiolouides, 2015; Lim et al., 2018; Mohtaramzadeh et.al, 2017).

There are several theories, models and frameworks that has been used to investigate B2B e-commerce adoption by SMEs such as Technology Organization and Environment (TOE) framework, Technology Acceptance Model (TAM), Theory of Reasoned Action (TRA) and Diffusion of Innovation (DOI). The Technological, Organizational and Environmental (TOE) framework has been suggested as a useful starting point in studying B2B e-commerce adoption (Alrousan, 2016; Scupola, 2009; Zhu & Kramer, 2005). TOE is suitable to explain the adoption of innovation, because it contains three contexts of organization: technological context, organizational context, and environmental context, that may influence the process of organization adoption of technological innovation.

However, TOE does not take into consideration the behavioral aspect such as perceived usefulness of a technology. It has been suggested that integrating TAM into TOE would be beneficial (Awa et.al, 2017). Since perceived usefulness is mediator in TAM, then integrating the mediator variable perceived usefulness into the TOE framework would provide better understanding of intention to continue using B2B e-commerce by the manufacturing SMEs in Jordan. Perceived usefulness is also expected to have an impact on the intention to continue using B2B e-commerce. In addition, in TOE, external IT support has generally played the role in the environmental context (Awa & Ojiabo, 2016; Ifinedo, 2011b). However, since Jordan is a country with many highly skilled IT engineers and technicians, it is expected that external IT support from the existing IT organizations within the country would play a moderating role between perceived usefulness and intention to continue using B2B e-commerce by the manufacturing SMEs. Such moderating role

of external IT support has often been overlooked in prior research related to the B2B e-commerce technology.

1.4 Research Objectives

The study aims to determine factors influencing the intention to continue using B2B e-commerce among Jordanian manufacturing SMEs. Specifically, there are five research objectives, stated as follows:

- 1) To determine the relationship between technological, organizational and environmental factors on the perceived usefulness.
- 2) To determine the relationship between perceived usefulness and intention to continue using B2B e-commerce.
- 3) To test the mediating effect of the perceived usefulness on the relationship between technological, organizational and environmental factors and the intention to continue using B2B e-commerce.
- 4) To test the moderating effect of external IT support on the relationship between the perceived usefulness and intention to continue using B2B e-commerce.
- 5) To provide valuable guidance to decision makers, IT consultants and web vendors on adopting, facilitating and accelerating the use of B2B e-commerce by manufacturing SMEs in Jordan.

1.5 Research Questions

- 1) What are the technological, organizational and environmental factors influencing perceived usefulness in manufacturing SMEs in Jordan?

- 2) What is the relationship between perceived usefulness and intention to continue using B2B e-commerce?
- 3) Does perceived usefulness mediate the relationship between technological, organizational and environmental factors and the intention to continue using B2B e-commerce?
- 4) Does external IT support moderate the relationship between the perceived usefulness and the intention to continue using B2B e-commerce?
- 5) What are the guidelines to decision makers, IT consultants and web vendors for use B2B e-commerce technology?

1.6 Research Scope

This study is focused on the manufacturing SMEs in Jordan. The SMEs are generally classified as micro, small and medium sizes based on the number of employees with Micro: 1-9, Small: 10-49 and Medium: 50-249. The target is organization level and the respondent is the representative of the organization with specific knowledge in terms of information technology and overall organization infrastructure.

1.7 Research Methodology

This study is an explanatory research, as this research attempts to examine the intention to continue using B2Be-commerce technology by Jordanian manufacturing SMEs. This can be achieved through an in-depth investigation of previous studies' findings and relevant models as to develop a conceptual framework, and propose hypotheses based on that framework and test them. This characterizes the study that is intertwined with a quantitative method of data collection and analysis.

The aim of this research is to determine the factors that influence intention to continue using B2B e-commerce by Jordanian SMEs in manufacturing sector. Thus, in order to get an overall picture of the research issue, collecting data from a large number of organizations is required. In addition, the selection of the method in this case is also determined by the type of theory and models employed to examine B2B e-commerce technology and diffusion research.

The proposed framework of this study is obtained through reviews of the models that have been used in previous studies. Based on several motivations and considerations with respect to the aim of this study, the proposed model for this study is finally constructed based on TOE framework integrated with TAM model. Factors affecting intention to continue using B2B e-commerce by Jordanian manufacturing SMEs are then identified using reviews of literature and discussions. As a result of the reviews and discussions, factors influencing intention to continue using B2B e-commerce by Jordanian manufacturing SMEs have been identified under the three contexts in the TOE framework. In the technological context there are two variables that have been identified which are relative advantage and compatibility. In the organizational context, two variables: financial resource and top management support, are identified. In the environmental context, the identified variables are competitive pressure, information intensity and security. This study extends the existing TOE framework by including the variable perceived usefulness from TAM model into the TOE framework. Perceived usefulness is considered as the mediating variable in determining the effect between TOE factors and the intention to continue using B2B e-commerce. Meanwhile, external IT support is considered as a moderator between perceived usefulness and the intention to continue using B2B e-commerce.

In this study, the primary data is collected through a survey using self-administered questionnaire, being the most appropriate tool for explaining relationships between variables. The sampling frame is obtained from the Amman Chamber of Industry, and sampling is done using simple random sampling method. Close-ended questions are used in the questionnaire that consists of two parts, the first of which includes demographical questions about the respondents and organization. Questions of the second part address the items that are used to measure the factors that influence intention to continue using B2B e-commerce, where the questions items are adapted from previous studies and modifications are made to the questionnaire items in order to meet the research aim and to suit the B2B e-commerce technology in Jordanian manufacturing SMEs. Questionnaire translation is done using the process of the translation equipollent of the questionnaire to ensure its validity. As a result, an Arabic version of the questionnaire is obtained. A pilot study is first conducted on 10 respondents upon which the necessary changes and improvements are made to the questionnaire. The final version of the questionnaire is then obtained and distributed to the respondents of Jordanian manufacturing SMEs.

The quantitative data collected have been analyzed using structural equation modeling (VB-SEM) Smart-PLS version 3.2.6 and SPSS version 22. The data obtained from the main study is screened and checked for missing data. Statistical techniques are used to analyze the data. Descriptive statistics analysis using SPSS software is used to obtain the statistics of the profile of respondents and the organization. Also, Harman's single factor test is used to detect the evidence of this bias using SPSS. For data analysis of the factors contributing to the intention to continue using B2B e-commerce by the Jordanian manufacturing SMEs, PLS-SEM

is used, which involves a two-step analysis: assessment of measurement model and assessment of structural models.

1.8 Significance of the Research

This study contributes to the theoretical body of knowledge by the identification and examination of the factors that affect the intention to continue using B2B e-commerce by manufacturing SMEs in Jordan.

1.8.1 Theoretical Contributions

The main theoretical contribution of this thesis can be summarized as follows:

- a) This research contributes to the existing concept of intention to continue using B2B e-commerce by taking into account the mediating effect of perceived usefulness from TAM model on the relationship between the technological, organizational and environmental factors and the intention to continue using B2B e-commerce.
- b) External IT support as a moderator is added in the proposed model. This is an important contribution to the existing literature in organizational technology adoption because the moderating role of external IT support has often been overlooked in prior research related to the B2B e-commerce technology in general. External IT support is determined as a new moderator on the relationship between the perceived usefulness and intention to continue using B2B e-commerce.
- c) This study extends the TOE framework by (Tornatzky & Fleischer, 1990), by integrating the mediator variable perceived usefulness from TAM into the TOE framework which would provide better understanding of intention to continue using B2B e-commerce by the manufacturing SMEs in Jordan.

1.8.2 Practical Contributions

The main practical contributions are as follows:

- (i) The findings serve to explain how the SMEs perceive the usefulness of B2B e-commerce technology in order to continue or enhance the use of B2B e-commerce and facilitate the widespread use of this business technology by SMEs. Currently, the expected growth of B2B e-commerce adoption by Jordan SMEs is slow and it is expected that many SMEs are not continuing the use of e-commerce despite the importance of this technology.
- (ii) The results of this research serve as guidelines for government agencies and non-profit organizations to evaluate their existing policies and strategies towards setting a framework for promoting B2B e-commerce continuance by SMEs in Jordan. Jordan Chamber of Industry, Amman Chamber of Industry, and Jordan Enterprise Development Corporation (JEDCO) are some examples of government agencies that can benefit from this study. Having external IT support would not only help SMEs to understand the importance of B2B e-commerce, but would also help SMEs in implementing B2B e-commerce as well as in training the employees to use this technology. With the confirmation of the role of external IT support as a moderator on the relationship between the perceived usefulness and intention to continue using B2B e-commerce, it is crucial that Jordan mobilize the IT organizations towards achieving the B2B e-commerce usage continuance of the manufacturing SMEs in the country.

1.9 Operational Definitions of Terms

The terms commonly used in this thesis are described as follows:

- a) **B2B e-commerce** is an internet-enabled technology, which facilitates sharing of information as well as buying and selling of products and services between and among business organizations, over the internet.
- b) **Compatibility** is defined as the compatibility of B2B e-commerce with the organization's existing values, with its preferred work practices and with the way its suppliers as well as its customers do their business. (Alam et al., 2016; Alam et al., 2011; Ghobakhloo et al., 2011).
- c) **Competitive Pressure** is defined as the pressure felt by the organization to use B2B e-commerce to gain competitive advantage in the marketplace (Garg & Choeu, 2015).
- d) **External IT Support** is defined as the availability and the effectiveness of the support from external sources with respect to the implementation and maintenance of B2B e-commerce (Ifinedo, 2011a; Ghobakhloo et al., 2011).
- e) **Financial Resource** is defined as the necessity and availability of funding for the organization to cover the cost incurred to use B2B e-commerce and also to maintain the technology (Kwadwo et al., 2016; Premkumar & Roberts, 1990; Sutanonpaiboon & Pearson, 2006).
- f) **Information Intensity** is defined as the complexity of the information required to understand the products or the services provided by an organization and also to understand the process of ordering them (Osakwe et al., 2016; Thong & Yap, 1995; Wang et al., 2016; Wang et al., 2011).

- g) **Intention to continue using B2B e-commerce** is defined as the intention of organization to frequently use and continue using B2B e-commerce in the organization in its current business practice and in its future practice (Omigie et al., 2015; Venkatesh et al., 2012).
- h) **Perceived Usefulness** is defined as the perception of the usefulness of B2B e-commerce for the decision makers to their organization (Davis, 1989; Nugroho & Fajar, 2017).
- i) **Relative Advantage** is defined as the advantage of using B2B e-commerce adoption to an organization in terms of communications, image, sales, cost and competitiveness (Alam et al., 2011; Hassan et al., 2017).
- j) **Security** is defined the trust or confidence of the organization in using B2B e-commerce (Alam et al., 2011; Garg & Choeu, 2015).
- k) **Small and Medium Enterprises (SMEs):** In Jordan, the SMEs is based on the number of employees with Micro: 1-9, Small: 10-49 and Medium: 50-249 and also based on the capital investment.
- l) **Top Management Support** is defined as the interest and the enthusiasm of the top management of the organization towards using B2B e-commerce in supporting the implementation and gain competitive advantage (Hassan et al., 2017; Ifinedo, 2011a; Mohtaramzadeh et al., 2017; Premkumar & Roberts, 1999; Wang et al., 2010).

1.10 Organization of Thesis

The structure of the thesis is as follows:

Chapter 2 reviews the relevant literature, presenting the benefit and the definition of e-commerce, definition of SMEs, levels of e-commerce, most prominent theories and

models in technology adoption by organizational level. The chapter also discusses the most influential factors of e-commerce adoption in literature.

Chapter 3 describes the research framework, the hypothesis development and the research framework for this study.

Chapter 4 discusses the research design and the selection of research appropriate methods. It also describes the sampling process and the sample for the study. The design and development of the questionnaire, the construct measurement, questionnaire translation, expert study and pilot study are discussed followed by the statistical analysis techniques used for this study.

Chapter 5 presents the data analysis and the main findings of this study. It discusses the response rate, demographic profile as well as the descriptive analysis. The partial least squares (PLS) analysis is used to determine the goodness of model fit. First, assessment of the measurement model is done for validity and reliability. Second, the structural model is analyzed for path coefficient significance as well as for hypothesis testing.

Chapter 6 discusses the key findings outlined in the previous chapter regarding the research objectives of this study, the contributions of the study, conclusion of the study and suggestions for future research.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Small and medium Enterprises (SMEs) have important roles to play in the economic sector of many countries where they contribute to the countries' economic growth by continually creating new jobs. E-commerce has introduced next generation of business transactions through internet. It has given birth to economic opportunities for developing nations and extended the reach of suppliers in contacting or even in demonstrating their strengths to buyers. It has provided easy global access for the manufacturers in developing nation with less cost of transaction and at almost no cost of communication which in turn helps the buyers get goods within their target prices (Saeed, 2016).

This chapter first discusses the SMEs, B2B e-commerce definitions and B2B e-commerce level of adoption. This is followed by the discussion of theories and models related to B2B e-commerce adoption with the overview of information system (IS) adoption theories, especially Innovation Theory, Technological-Organization-Environmental model (TOE), Diffusion of Innovation Theory (DOI) and the Technology Acceptance Model (TAM).

2.2 SMEs Definitions and Importance

The Small and Medium Enterprises (SMEs) have been defined in different ways. In general, the SMEs are defined based on the number of employees.

The SMEs in Australia is defined based on the number of employees where the SMEs are businesses with less than 200 employees (Scupola, 2009) while in Denmark, by the European Parliament's definition, the SMEs can have up to 250 employees. The commonly agreed definition throughout the world is that small or medium enterprises employ few people and are characterized by their relatively small amount of capital and turnover. For example, the Italian SMEs are identified by the amount of turnover, number of employees and total value of assets (Cillo et al., 2010).

The SMEs play an important part towards the economic development of different nations. The importance of SMEs increases over the years and they have become the backbone of a country's economy, especially in developing countries, with a significant role of creating employment opportunities. Out of the total number of business organizations around the globe, the SMEs represent 90% of them. (Alzougool & Kurnia, 2008). Furthermore, SMEs constitute the majority of enterprises in developing countries and are considered as one of the most important factors in economic and social growth, employment, local development and poverty reduction. Considering the growing importance of the SMEs, many researchers have focused on the issues related to its development and it has therefore become the main topic for a number of analyses (Hosseininia & Ramezani, 2016).

The SMEs in Kenya, which amount to 99.9% of enterprises in the country, play the important role in creating wealth and providing employment opportunities towards the economy of Kenya (Makau et al., 2013). In Malaysia, SMEs play a critical role in the country's industrialization where they account for more than 95% of total business organizations in Malaysia, and contribute about 32% of Gross Domestic Product (GDP) and 65% of total employment. There are two criteria to

identify the size of respective industries: (a) number of employees and (b) the annual sales turnover (Lim et al., 2016).

In Jordan, the SMEs contribute 98% of the Jordanian economy. According to the Ministry of Industry and Trade, the Amman Chamber of Industry as well as JEDCO, the SMEs in the country are classified as micro, small and medium sizes. The classification is based on based on the amount of capital and the number of employees, where the enterprises with capital of less than USD 42,440 and employees fewer than 9 are defined as Micro enterprises. Meanwhile, the enterprises with capital of USD 42,440 or more are then further classified as either Small or Medium depending on the number of employees where Small has between 10 and 49 employees and Medium has between 50 to 249 employees. The classification of the SMEs in Jordan is tabulated in Table 2.1.

Table 2.1
Definition of SMEs in Jordan

Classification	Capital investment (USD*)	No. of Employees
Micro	Less than 42,440	1-9
Small	42,440 and above	10-49
Medium	42,440 and above	50-249

*1.00 USD = 0.7 JD

Source: (JEDCO, 2011)

2.3 B2B E-commerce Definition

The definition of e-commerce given by the United Nations Economic and Social Commission for Western Asia (ESCWA) is as follows: “*E-commerce is defined as conducting purchase, sale, auction and tender transactions online. In addition to selling products by providers and retailers, e-commerce includes the sale of services and information, including computer systems and applications.*”

For B2B e-commerce, there are many definitions based on different perspective views as listed in Table 2.2.

Table 2.2:
B2B E-commerce definition

B2B E-commerce	Source
Defined as an inter-organizational technological innovation that enables inter-firm process integration and allows supply chain partners to trade and share information online.	Alsaad et al. (2017)
Defined as the use of electronic communications and digital information processing technology in business transactions to create, transform, and redefine relationships for value creation between or among organizations.	Bagale (2014)
Defined as business and customer relationships, business processes, providing new distribution channels, new delivery methods, new payment methods and a new medium for communication.	Cosgun & Dogerlioglu (2012)
Defined as the process of buying and selling products or services using electronic data transmission via the Internet and the World Wide Web (www).	Grandon & Pearson (2004)
Defined as the conduct business transactions over the Internet, which includes the exchange of information of value in the form of products and services as well as payments, using web-based technologies.	Jian (2010)
Defined as any economic or business activity that uses Information Communication Technology (ICT) based applications to enable the buying and selling of products and services and to facilitate the transaction of business activities between and among businesses.	Kenneth et al. (2012)
Defined as the exchange of products/services and information via computer networks, including the internet, extranet and intranet.	Kurnia et al.(2015)
Defined as the digitally enable commercial transaction between and among organizations.	Laudon & Traver (2014)

Table 2.2 (*Cont.*)

Defined as internet-enabled technologies that allow firms to buy and sell products and services electronically, and share value chain information.	Mohtaramzadeh et al. (2017)
Defined as the process of buying, selling, transferring, or exchanging products and services, through computer networks, principally the internet.	Turban et al. (2004)

The definitions are generally based on two general perspective views. From the technology's perspective view, B2B e-commerce is defined as sharing of data and business information, between organizations and between the organization and customers by means of telecommunications networks (Bagale, 2014; Cosgun & Dogerlioglu, 2012; Jian, 2010; Kenneth et al., 2012; Mohtaramzadeh et al., 2017). From the commercial perspective view, B2B e-commerce is defined as the purchase and sales of products where the business transactions take place between businesses and customers (Grandon & Pearson, 2004; Kurnia et al., 2015; Laundon & Traver, 2014; Turban et al., 2004).

Based on the previous definitions of B2B e-commerce and in considering the study's aims, this study defines B2B e-commerce as internet-enabled technology, which facilitates sharing of information as well as buying and selling of products and services between and among business organizations, over the internet.

2.4 Benefits of B2B e-commerce Technology

B2B e-commerce is beneficial to organizations in many aspects. Major benefits of this technology are as listed in Table 2.3.

Table 2.3
B2B e-commerce benefits

Benefits	Source
Transaction cost saving, improved efficiency and strategic flexibility by developing more dynamic and flexible relationships with key business partners.	Alam et al. (2011)
To enhance productivity and to increase the enterprise's performance by creating a knowledge-based economy and reduction in transaction cost.	Al-Bakri & Katsioloudes (2015)
Cost reductions, efficiency improvements, better supplier relationships, access to global markets, new customers and suppliers, productivity improvements, increased profits, and gains in competitive advantage	Elbeltagi et al. (2016)
Increase in productivity that enables the creation of new relationships with customers, distributors, suppliers and other strategic partners.	Jian (2010)
Increased accessibility to providers, reduction in supply chain and inventory costs.	Lin et al. (2010)
Market expansion, reduction of product source prices, promotion of productivity, reduction of transaction costs and inflation, lowering uncertainty, sharing market information.	Ma'aruf & Abdulkadir (2012)
To enhance their competitiveness and thereby build their own competitive advantage.	Nurhadi et al. (2015)
To reduce cost, increased sales, increased productivity, reduced time processing and extended market reach.	Rahaya & Day (2015)
It provided easy global access for the manufacturers in developing nation, less cost of transaction and almost free communication.	Saeed (2016)
Up-to-date organization material; All distributed material is up-to-date.	Wu et al. (2003)
To improved organization performance in sales, internal processes and customer/supplier relationships through market expansion and improved transactional efficiencies.	Zhu & Kraemer (2002); Zhu (2004)

Based on Table 2.3, it can be summarized that B2B e-commerce brings benefits to organizations in terms of:

- (i) Improving productivity by creating new relationships through customer or supplier and other strategic partners
- (ii) Enhancing cost saving in transaction costs and improving transaction efficiencies
- (iii) Enhancing the competitive advantages
- (iv) Increasing the speed of business
- (vii) Accessing a wide range of markets
- (viii) Improving organization performance in sales

2.5 Levels of B2B e-commerce Adoption

It is important to realize that in an organization, B2B e-commerce activities may involve entry-level activities to advanced level activities (Cloete, 2002). The entry level activities may include having a web browser, a website and email while the advanced-level activities may include online orders and payments as well as customer services.

There are four sequential clusters of e-commerce adoption (Daniel et al. 2002). The first cluster is called developers, where organizations have a simple stage of e-commerce. The term developers refer to organizations that are currently developing e-commerce services and are at the beginning of their e-commerce adoption. Activities under development cluster include customer-business and supplier-business communication through e-mail and the development of the website to display organization and product information, which functions as a means of advertising and brand building. The second cluster is called communication, where